UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/659,958	09/10/2003	Jiann-Chang Lo	42P15593	5862

59796 7590 02/23/2009

INTEL CORPORATION
c/o CPA Global
P.O. BOX 52050
MINNEAPOLIS, MN 55402

EXAMINER	
GOLUB, MARCIA A	

ART UNIT	PAPER NUMBER
2828	

MAIL DATE	DELIVERY MODE
02/23/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte JIANN-CHANG LO,
ANDREW DAIBER, MARK S. RICE,
and RAJESH K. BATRA

Appeal 2009-0310
Application 10/659,958
Technology Center 2800

Decided:[1] February 23, 2009

Before ADRIENE LEPIANE HANLON, CHUNG K. PAK, and CATHERINE Q. TIMM, *Administrative Patent Judges*.

HANLON, *Administrative Patent Judge*.

DECISION ON APPEAL

---

[1] The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, begins to run from the decided date shown on this page of the decision. The time period does not run from the Mail Date (paper delivery) or Notification Date (electronic delivery).

A. STATEMENT OF THE CASE

This is an appeal under 35 U.S.C. § 134 from an Examiner's decision rejecting claims 1, 8, 15, and 22, all of the claims pending in the application. We have jurisdiction under 35 U.S.C. § 6(b). We AFFIRM.

The following Examiner's rejections are before us:

Claims 1 and 15 are rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Vujkovic-Cvijin[2] and Koch.[3]

Claims 8 and 22 are rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Vujkovic-Cvijin, Koch, and Kuo.[4]

The claims on appeal are directed to a tunable laser (claims 1 and 8) and a system for tuning an external cavity diode laser (claims 15 and 22).

Claim 1 is representative of the subject matter on appeal and reads as follows:

> 1. A tunable laser, comprising:
>
> a temperature controlled sled;
>
> an etalon;
>
> a multiple bandwidth mode controller comprising a high bandwidth mode and a lower bandwidth mode,
>
> said controller to initially drive said etalon in said high bandwidth mode for a coarse tuning adjustment and switch to said lower bandwidth mode to drive said temperature controlled sled for fine tuning adjustment when an error signal associated with a target frequency is within a threshold range.

Ans. 12, Claims Appendix.[5]

---

[2] US 6,724,789 B2 issued to Vujkovic-Cvijin on April 20, 2004.
[3] US 6,359,915 B1 issued to Koch et al. on March 19, 2002.
[4] US 6,222,861 B1 issued to Kuo et al. on April 24, 2001.

B. ISSUES

(1) Have the Appellants shown that the Examiner reversibly erred in concluding that the combined teachings of Vujkovic-Cvijin and Koch would have suggested using an etalon for coarse tuning adjustment as recited in claim 1?

(2) Have the Appellants shown that the Examiner reversibly erred in concluding that the combined teachings of Vujkovic-Cvijin, Koch, and Kuo would have rendered obvious the subject matter of claims 8 and 22?

C. FINDINGS OF FACT

The following findings of fact are supported by a preponderance of the evidence. Additional findings of fact as necessary appear in the Analysis portion of the opinion.

1. Appellants' Specification

The Appellants describe etalons and their operation in the disclosed invention as follows:

> Generally, etalons are employed in laser cavities to provide filtering functions. They function as Fabry-Perot resonators. The result of passing an optical beam through an etalon produces a set of transmission peaks (also called passbands) in the laser output. The spacing of the transmission peaks (in frequency, also known as the free spectral range) is dependent on the distance between the two faces of the etalon, e.g., faces 516 and 518 for filter F1, and faces 520 and 522 for filter F2. As the temperatures of the etalons change, the etalon material is caused to expand or contract, thus causing the distance between the faces to change. This effectively changes the optical path length of the etalons, which may be employed to shift the transmission peaks.
>
> * * * * *

[5] Appeal Brief dated April 23, 2007.

> In one embodiment, one of the filters, known as a "grid generator," is configured to have a free spectral range corresponding to a communications channel grid, such as the ITU wavelength grid, and the peaks are aligned with ITU channel frequencies. This wavelength grid remains substantially fixed by maintaining the temperature of the corresponding grid generator etalon at a predetermined temperature. At the same time, the temperature of the other etalon, known as the channel selector, is adjusted so as to shift its transmission peaks relative to those of the grid generator. By shifting the transmission peaks of the filters in this manner, transmission peaks corresponding to channel frequencies may be aligned, thereby producing a cavity lasing mode corresponding to the selected channel frequency.

Spec., paras. [0035], [0036].

2. Vujkovic-Cvijin

Vujkovic-Cvijin discloses a multiple channel fiberoptic light source, particularly for use in dense wavelength division multiplexed (DWDM) systems. Vujkovic-Cvijin 1:14-17.

Vujkovic-Cvijin Figure 10A is a block diagram schematically illustrating control loops included for a single channel of the fiberoptic source in the DWDM system. Vujkovic-Cvijin 5:52-54.

Figure 10A is reproduced below:

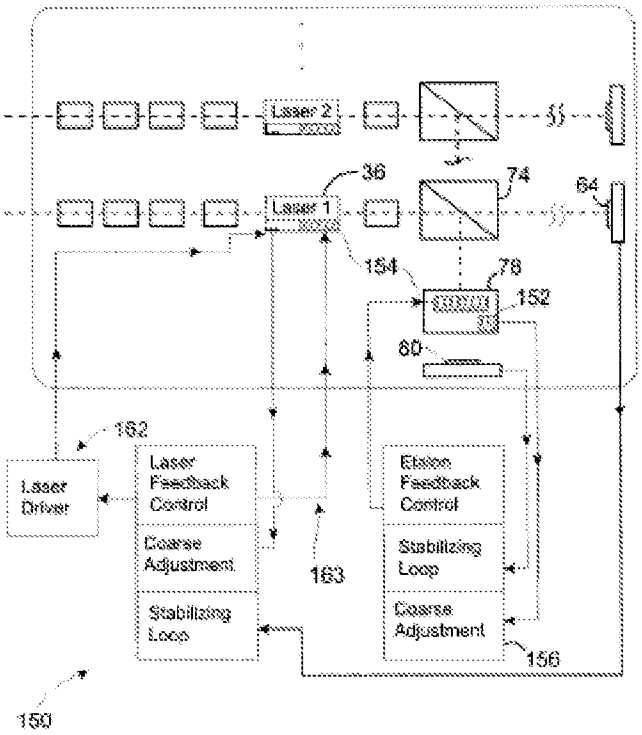

FIG. 10A

Vujkovic-Cvijin Figure 10A depicts control loops for a single channel of a fiberoptic source.

According to Vujkovic-Cvijin:

> Preferably, laser tuning is accomplished using at least two control loops. The first control loop may selectively shift the frequency grid as a unit. This may be effected, for example, by controlling a temperature of the etalon to which lasers are referenced. The second loop sequentially locks each of the lasers to a particular point on the frequency grid or comb.

Vujkovic-Cvijin 9:1-6.

Referring to Figures 10, 10A, and 11, Vujkovic-Cvijin explains the operation of the electronic control system as follows:

> Two photodiodes are used as input sensors for each laser. One photodiode 64 is used to identify the reference frequency via gas absorption, and one photodiode 80 for alignment of the frequency of the laser with the etalon transmission grid. Hence, the electronic control circuit can adjust the laser frequency to any selected channel within a DWDM communication system.

Vujkovic-Cvijin 11:5-11.

Vujkovic-Cvijin continues:

> For the etalon plate (or other frequency grid generator), the center (or other selected) frequency may be adjusted and stabilized by etalon feedback control 156 using the dedicated etalon heater thermally coupled to the etalon plate. A dedicated thermistor is used to bring the temperature of the etalon within the range desired (coarse tuning). . . . Once again, for both the laser and etalon, the thermistor, heaters, and other thermal management components may be used to adjust the gross desired frequency range. Fine tuning and fast feedback-driving stabilization may be accomplished with reference to the photodiode outputs.

Vujkovic-Cvijin 11:26-41.

3. Koch

Koch discloses a Distributed Bragg Reflector laser that allows for both a coarse tuning through mode selection, by adjusting the index of the Bragg region, and fine tuning, by adjusting the temperature of the whole laser. Koch 2:54-59.

D. PRINCIPLES OF LAW

A claimed invention is not patentable if the subject matter of the invention would have been obvious to a person having ordinary skill in the art at the time the invention was made. 35 U.S.C. § 103(a); *KSR Int'l Co. v.*

Teleflex Inc., 127 S. Ct. 1727, 1734 (2007); *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 13 (1966).

The test for obviousness is not that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to one of ordinary skill in the art. *In re Keller*, 642 F.2d 413, 425 (CCPA 1981).

A person of ordinary skill is not an automaton but is a person of ordinary creativity. *KSR*, 127 S. Ct. at 1742. One of ordinary skill in the art is presumed to have skills apart from what the prior art references expressly disclose. *In re Sovish*, 769 F.2d 738, 742 (Fed. Cir. 1985).

E. ANALYSIS

1. Issue (1)[6]

The Examiner found that Vujkovic-Cvijin discloses a tunable laser comprising a temperature controlled sled 154, an etalon 78, and a multiple bandwidth mode controller comprising a high bandwidth mode and a lower bandwidth mode. Ans. 3, 4[7]; Vujkovic-Cvijin Figures 10 and 10A.

The Examiner found that Vujkovic-Cvijin does not disclose that the controller drives the etalon in the high bandwidth mode for a coarse tuning adjustment or drives the temperature controlled sled in the lower bandwidth mode for fine tuning adjustment. Ans. 3.

However, the Examiner found that Koch discloses a tunable laser that is mode locked by coarse tuning a filter (e.g., a Bragg region) and fine tuned by adjusting the temperature of the laser. Ans. 3; Koch 2:54-63.

---

[6] The Appellants do not argue the patentability of claim 15 separately from the patentability of claim 1. *See* 37 C.F.R. § 41.37(c)(1)(vii) (2007).
[7] Examiner's Answer dated July 5, 2007.

The Examiner concluded that it would have been obvious to one of ordinary skill in the art to incorporate the teachings of Koch into the device of Vujkovic-Cvijin by driving the mode controller in the coarse mode (by adjusting the etalon) and fine tuning (by controlling the temperature) for at least the purpose of mode locking the laser to a desired wavelength. Ans. 3.

The Appellants do not point to any error in the Examiner's findings. Rather, the Appellants argue that the Examiner improperly combined Vujkovic-Cvijin and Koch. In particular, the Appellants argue that Vujkovic-Cvijin controls coarse tuning with temperature in contrast to the claimed invention which controls coarse tuning with an etalon. The Appellants argue that even if one were to combine the references as proposed by the Examiner, the multimode controller of Vujkovic-Cvijin would still use temperature for coarse adjustments "as this is what is clearly taught." Br. 8.

The Appellants' argument is not persuasive of reversible error. In the §103(a) rejection before us, the Examiner relied on Koch to establish that it was known in the art to use a filter for coarse tuning adjustments. *Keller*, 642 F.2d at 425. The record before us establishes that an etalon, as disclosed in Vujkovic-Cvijin, provides filtering functions and is adjustable in response to a change in temperature. *See* Spec., paras. [0035], [0036]; Vujkovic-Cvijin 11:5-11, 26-41. Thus, the Examiner had a reasonable basis for finding that the combined teachings of Vujkovic-Cvijin and Koch would have suggested using a filter, such as a temperature controlled etalon, to control the coarse tuning adjustments in the tunable laser of Vujkovic-Cvijin. The Appellants have failed to direct us to any evidence to the contrary.

In sum, the Appellants have not shown that the Examiner reversibly erred in concluding that the combined teachings of Vujkovic-Cvijin and Koch would have suggested using an etalon for coarse tuning adjustment as recited in claim 1.

2. Issue (2)

The Appellants do not point to any error in the Examiner's findings of fact or conclusion of obviousness as to claims 8 and 22. Rather, the Appellants argue that Kuo fails to overcome the deficiencies of Vujkovic-Cvijin and Koch in the rejection of claim 1. Br. 9-10.

For the reasons set forth above, the combined teachings of Vujkovic-Cvijin and Koch would have rendered obvious the subject matter of claim 1. Therefore, there are no deficiencies in Vujkovic-Cvijin or Koch that must be overcome by Kuo in the rejection of claim 1.

F. DECISION

The decision of the Examiner is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a) (2008).

AFFIRMED

cam

INTEL CORPORATION
C/O CPA GLOBAL
P.O. BOX 52050
MINNEAPOLIS, MN 55402